2002 Annual Compliance Report
Grand Junction, Colorado, Disposal Site

Compliance Summary

The site, inspected on March 19, 2002, was in excellent condition. The part of the disposal cell that remains open is operated by the Long-Term Radon Management Project to receive additional low-level radioactive waste materials from various sources. The annual inspection addresses only the closed and completed portion of the disposal cell and surrounding disposal site.

Loose perimeter signs were resecured and missing signs were replaced. Plants, primarily annual weeds, are continuing to encroach on the disposal cell, especially on the south side. The revegetation of the former ramp area on the east side of U.S. Highway 50 is establishing, but is spotty. Inspectors identified no requirement for a follow-up or contingency inspection.

Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Grand Junction, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Interim Long-Term Surveillance Plan for the Cheney Disposal Site Near Grand Junction, Colorado* (DOE/AL/62350–243, Rev. 1, U.S. Department of Energy [DOE], Albuquerque Operations Office, April 1998), and in procedures established by the DOE Grand Junction Office to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 6–1.

Table 6–1. License Requirements for the Grand Junction, Colorado, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.0	Section 1.0
Follow-up or Contingency Inspections	Section 3.0	Section 2.0
Routine Maintenance and Repairs	Sections 2.7.3 and 4.0	Section 3.0
Ground Water Monitoring	Section 2.6	Section 4.0
Corrective Action	Section 5.0	Section 5.0

Compliance Review

1.0 Annual Inspection and Report

The site, south of Grand Junction, Colorado, was inspected on March 19, 2002. Results of the inspection are described below. Features mentioned in this report are shown on Figure 6–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

1.1 Specific Site Surveillance Features

Site Access Gate, Access Road, and Entrance Gate—The site access gate is a steel, double-swing stock gate that is secured by a chain and DOE padlock. The gate, in excellent condition, controls access to the site from U.S. Highway 50. A paved all-weather access road extends approximately 1.7 miles east along DOE's perpetual right-of-way, through federal land administered by the U.S. Bureau of Land Management, to the site entrance gate. The site entrance gate is a double-swing chain link gate in excellent condition, and is secured by a DOE padlock keyed the same as the site access gate. The fence along the right-of-way corridor was in good condition.

The drainage ditch along the south side of the access road discharges into an arroyo approximately 600 feet from the site access gate located on U.S. Highway 50. Erosion is occurring at the outfall of the drainage ditch. Because the erosion threatens the integrity of the access road, the outfall of the drainage ditch will be monitored and erosion control measures will be evaluated.

6A

Entrance and Perimeter Signs—The entrance and perimeter signs, installed on galvanized steel posts set in concrete, were in excellent condition.

Additional warning signs are posted on the wire perimeter fence and are associated with the operation of the open cell. Metal "Controlled Area" signs and yellow plastic "No Trespassing" signs are secured to the fence in pairs. There are 75 warning sign locations, each about 200 feet apart along the site boundary. Loose metal signs were resecured and missing plastic signs were replaced with metal signs.

6B

Site Marker and Boundary Monuments—Granite site markers will not be installed at this site until the entire disposal cell is closed at the end of the Long-Term Radon Management Project.

The site has four permanent boundary monuments, one at each of the four corners. The monuments mark the exact location of the site corners. All were in excellent condition and adequately protected.

Monitor Wells—The ground water monitoring network consists of three monitor wells. All three wells are inside the site boundary. The wells were secure and in excellent condition.

1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into five areas referred to as transects: (1) the closed portion of the disposal cell; (2) the diversion structures and drainage channels; (3) the area between the disposal cell and the site boundary; (4) the site perimeter; and (5) the outlying area.

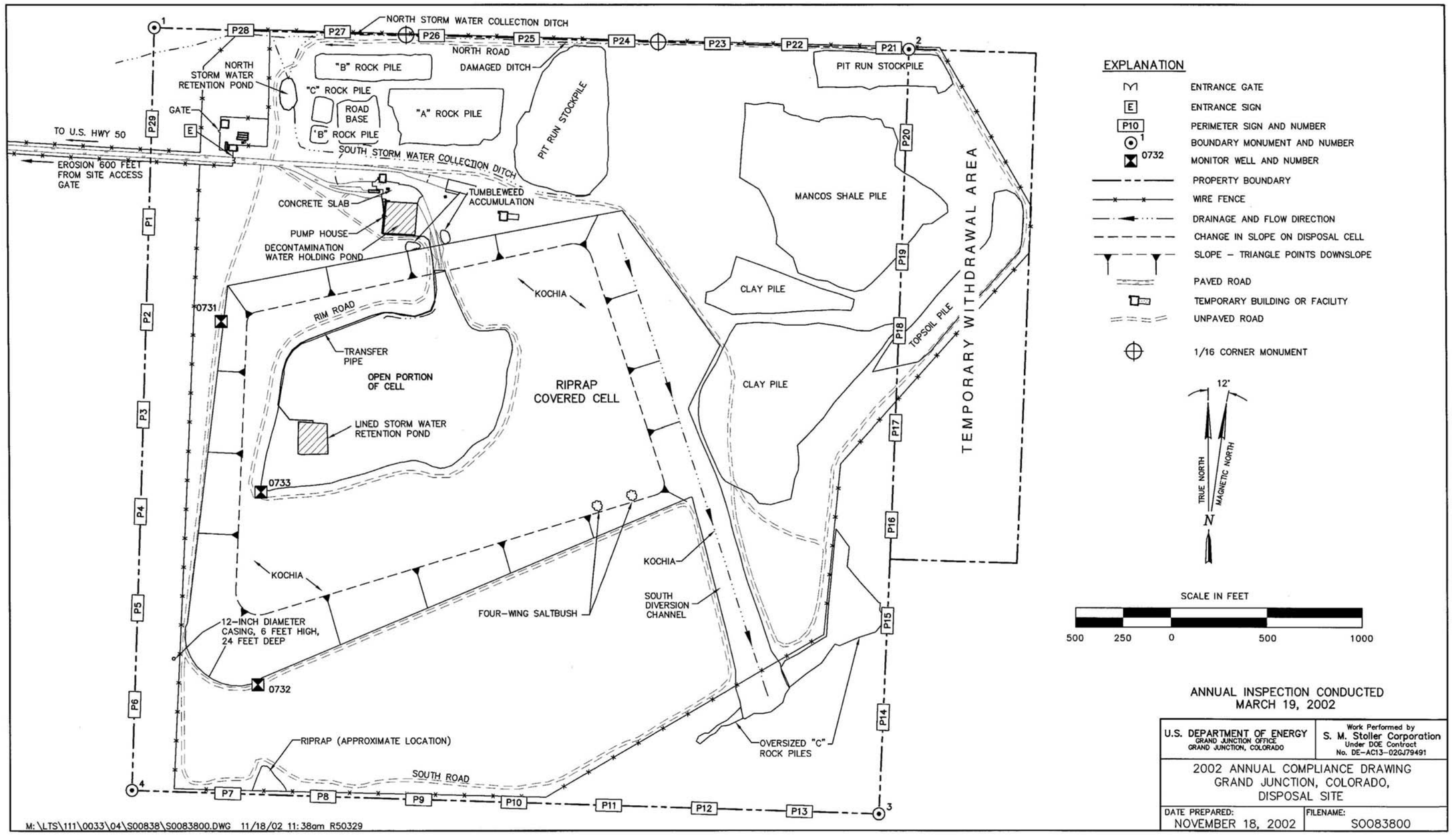

Figure 6–1. 2002 Annual Compliance Drawing for the Grand Junction, Colorado, Disposal Site

Closed Portion of the Disposal Cell—DOE will manage the open cell at the disposal site to accept waste until 2023 or until the cell is filled to its design capacity. The annual inspection does not include the open cell or the temporary structures associated with the operation of the open cell, except as they may affect the long-term safety and performance of the closed portion of the disposal cell. The open cell occupies approximately 7 acres in the center of the disposal cell. A lined retention pond is at the bottom of the open cell to collect storm water for dust control. The pond also reduces leaching through the cell and into the underlying strata.

The top and side slopes of the disposal cell are covered with basalt riprap. The rock was in excellent condition.

Plant encroachment is occurring, mostly on the southeastern part of the disposal cell top. Deep-rooted plants, which were cut back and treated with herbicide in 2001, may change the performance characteristics of the radon/infiltration barrier. This condition needs to be evaluated as part of the work underway by the DOE Long-Term Performance and Cover Monitoring Project to determine if control of these plants is necessary. Until the evaluation is
6C completed, these plants will be controlled. The disposal cell cover will continue to be monitored for plant encroachment; however, no additional plant control was required in 2002.

The riprap-armored side slopes of the disposal cell were in excellent condition. There was very little plant encroachment observed on the side slopes, and there was no evidence of slope instability.

Diversion Structures and Drainage Channels—The south diversion channel is a large riprap-armored structure that conveys storm runoff from the disposal cell southeast into a natural drainage that flows away from the site to the southwest. Some minor plant growth, mostly kochia and Russian thistle, exists within the channel. There was not enough plant growth to impede water flow within the channel. The diversion channel was in excellent condition.

Other drainage features at the site include north and south storm water collection ditches and a storm water retention pond. These features are along the northern edge of the disposal site. The ditches are small and unimproved. The north storm water collection ditch captures runoff from a large catchment area north and east of the disposal site. Water captured in this ditch flows into a large natural drainage north and west of the disposal cell. Minor erosion was previously noted west of the perimeter fence where the north storm water collection ditch ends and water spills down slope into the natural drainage northwest of the disposal site. Erosion did not appear to have occurred since the last inspection; however, the outflow area below the mouth of the north storm water collection ditch should continue to be monitored. The north road crosses the north storm water collection ditch between signs perimeter signs P24 and P25. Tire ruts have caused
6D water to leave the collection ditch and flow down the road. The ditch will be reconstructed at the vehicle crossing in 2003. The south storm water collection ditch collects onsite storm water from the cover material stockpile areas and other places across the northern part of the site. This ditch flows west into the north storm water retention pond. A second ditch flows south into the north storm water retention pond. Both ditches are small and are filling with sediment and weeds. Inspectors noted that the ditches showed signs of having conveyed water without overtopping. The ditches did not need maintenance, but at some point they may need to be cleaned out to convey storm water.

Area Between the Disposal Cell and the Site Boundary—In addition to the temporary buildings and structures used by the Long-Term Radon Management Project, 12 discrete stockpiles of rock and soil are located between the disposal cell and the site boundary on the north and east sides of the disposal cell. These materials eventually will be used by the Long-Term Radon Management Project to cover and close the open cell. Rill erosion is occurring on some of the soil stockpiles, but inspectors saw no indication of off-site sediment transport. Natural vegetation is beginning to grow on these stockpiles and eventually will hold the soil in place. If not, the soil stockpiles could be reseeded to help prevent erosion.

On the south and west sides of the disposal site, between the disposal cell and the perimeter fence, the ground is relatively flat and covered with native vegetation that consists primarily of perennial grasses and small shrubs. Unlike the areas north and east of the disposal cell, the areas south and west are mostly undisturbed. No erosion was observed south and west of the disposal cell.

Site Perimeter—The perimeter fence surrounding the site consists of a combination of square wire mesh at the bottom and two strands of barbed wire along the top, both supported by steel t-posts. The fence was in good condition and there was no evidence of livestock entering the enclosed area.

The fence runs along or near the property line on the north and south sides of the site, about 200 to 300 feet inside the property line on the west, and as much as 1,000 feet inside at the southeast corner of the site. On the east side, the fence extends beyond the site boundary to enclose part of an adjoining 40-acre temporary withdrawal area that is federal land administered by U.S. Bureau of Land Management. DOE uses the temporary withdrawal area to stockpile cover materials for the eventual closure of the open cell.

Outlying Area—The area outward from the disposal site for a distance of 0.25 mile was visually inspected. No development or disturbance that could affect the disposal site was observed.

2.0 Follow-up or Contingency Inspections

No follow-up or contingency inspections were required in 2002.

3.0 Routine Maintenance and Repairs

Warning signs on the perimeter fence were resecured or replaced as needed.

4.0 Ground Water Monitoring

DOE monitors ground water to detect seepage from the disposal cell.

Monitoring of ground water in the uppermost aquifer (Dakota Sandstone) beneath the disposal site is not required because the ground water is of limited use, based on the total dissolved solids (TDS) content exceeding 10,000 milligrams per liter (mg/L) (40 CFR Part 192.21(g)). Confined ground water in the uppermost aquifer lies approximately 750 feet below the existing ground surface and is hydrogeologically isolated from the tailings material by mudstones and shales of the Mancos Shale.

In lieu of monitoring ground water in the uppermost aquifer, ground water in two monitor wells in or very near buried paleochannels adjacent to the disposal cell (0731 and 0732) and one monitor well in the disposal cell (0733) is monitored to assess performance of the disposal cell and to ensure that any water in the paleochannels is not impacted by seepage from the disposal cell (Figure 6−1). The paleochannel wells are located along the west (downgradient) edge of the disposal cell and are screened at the interface between the alluvium and shallow Mancos Shale. The third well is in the southwest corner of the open portion of the disposal cell and is used primarily for measurement of water levels in the deepest part of the disposal cell to demonstrate that intracell water will not rise high enough to move laterally into the paleochannels. The water level in the disposal cell well (0733) is approximately 15 and 35 feet lower (deeper) than water levels in the paleochannels at wells 0731 and 0732, respectively (Figure 6–2). This indicates that ground water cannot seep from the disposal cell to the paleochannels. The disposal cell is designed to shed rainfall and snowmelt efficiently; therefore, variable water levels in the paleochannel wells could be attributed to increased runoff from the cell.

Samples are analyzed for standard field parameters and the following indicator analytes: molybdenum, nitrate, selenium, sulfate, TDS, uranium, vanadium, and polychlorinated biphenyls (PCBs). Analytes with maximum concentration limits (MCLs) established in Table 1 to Subpart A of 40 CFR 192 are molybdenum, nitrate, selenium, and uranium.

Results from sampling in 2002 were consistent with results from the past several years. Molybdenum and vanadium concentrations in ground water continued to be near or below the required laboratory detection limits and significantly below the MCL or risk-based standard at all wells. Nitrate concentrations exceeded the MCL of 44 mg/L in wells 0732 and 0733, but were below the MCL in well 0731 (Figure 6–3). Selenium levels continued to exceed the MCL of 0.01 mg/L at both downgradient wells and remained below the standard at monitor well 0733 (Figure 6−4). Sulfate concentrations continued to be relatively high in all wells, at approximately 6,500 mg/L in the disposal cell, and just below 4,000 mg/L in the paleochannel wells. High sulfate concentrations are typical of the regional soils, which contain gypsum. Concentrations of TDS continued above 10,000 mg/L in well 0733 in the disposal cell. Concentrations of TDS in ground water in the paleochannel wells were around 7,000 mg/L. Uranium concentrations in ground water remained approximately at the MCL of 0.044 mg/L in well 0731, but below the MCL in wells 0732 and 0733 (Figure 6–5).

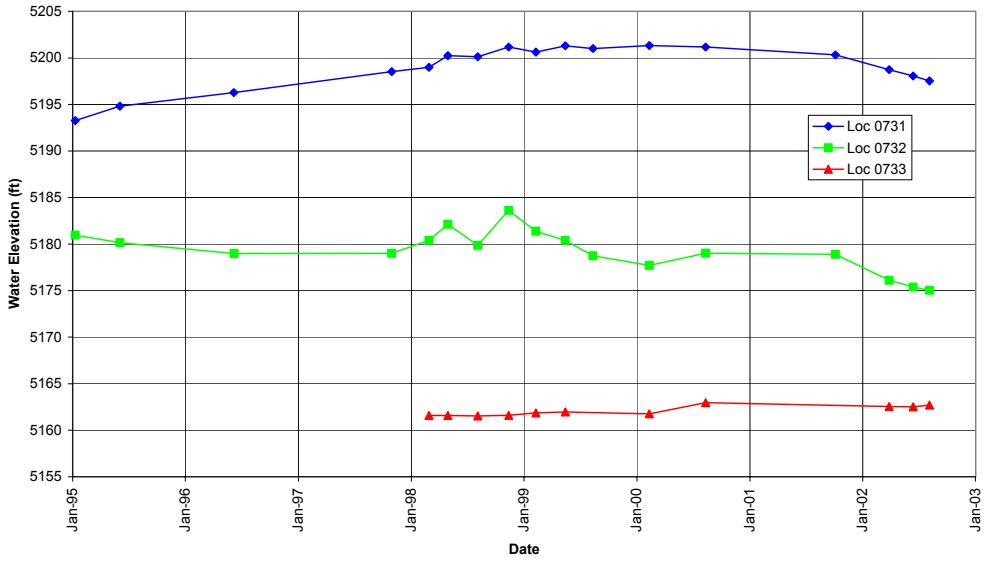

Figure 6−2. Water Level Measurements at the Grand Junction, Colorado, Disposal Site

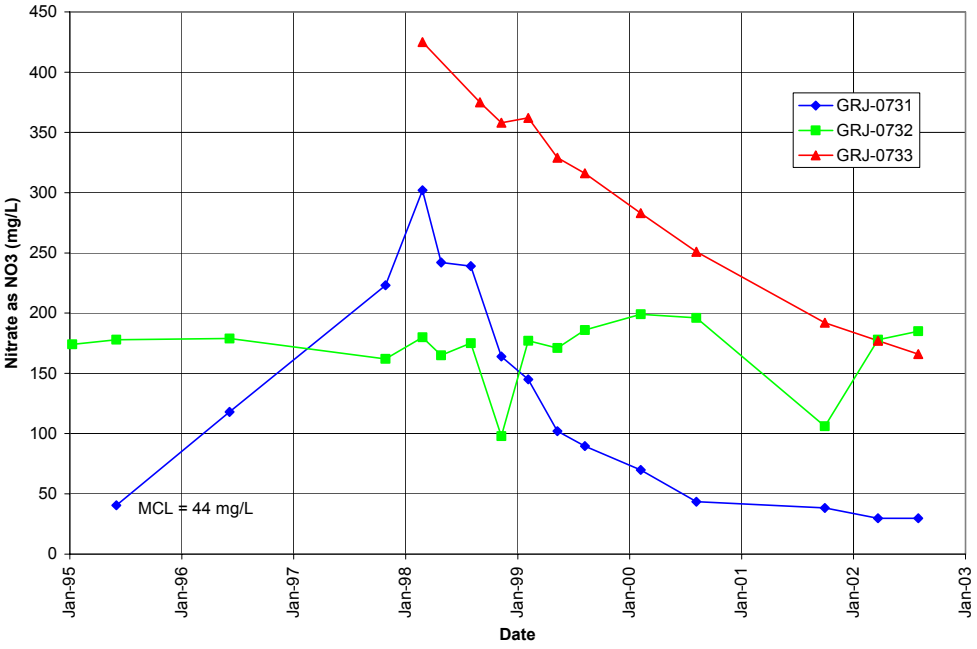

Figure 6−3. Time-Concentration Plots of Nitrate (as NO_3) in Ground Water at the Grand Junction, Colorado, Disposal Site

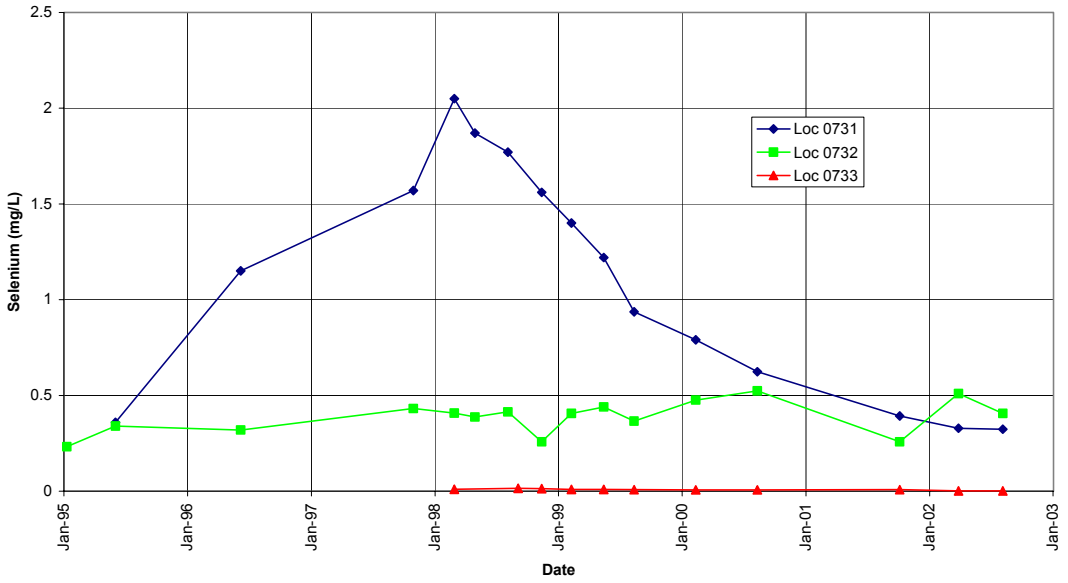

Figure 6−4. Time-Concentration Plots of Selenium in Ground Water at the Grand Junction, Colorado, Disposal Site

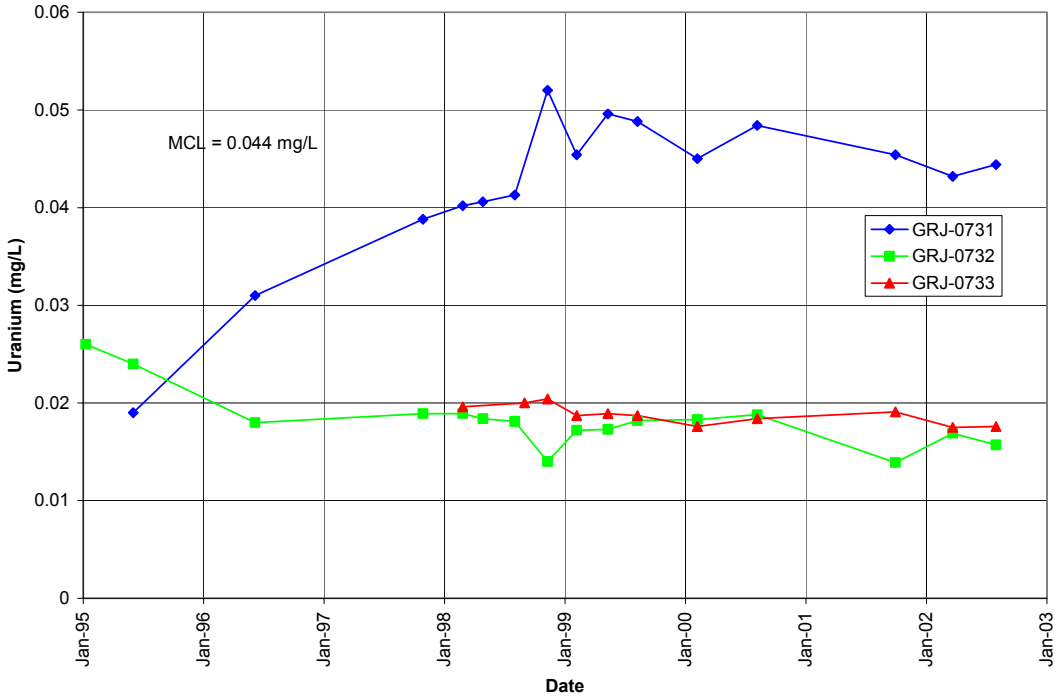

Figure 6−5. Time-Concentration Plots of Uranium in Ground Water at the Grand Junction, Colorado, Disposal Site

PCBs were not detected in ground water in any of the wells. Analysis of PCBs was included because of permitted disposal of a very small amount of PCB-contaminated material in the disposal cell. Because these compounds have low mobility due to their tendency to adsorb to organic carbon, clays, and other materials, they are not expected to migrate into ground water.

Nitrate, selenium, sulfate, TDS, and uranium concentrations in ground water in monitor well 0731 peaked around 1998 and have declined steadily since then. A possible explanation for this decline is the disturbance of the paleochannel near monitor well 0731, which may have exposed native material to ground water. In comparison, concentrations at monitor well 0732, where the paleochannel was not disturbed, remain generally constant. Sampling in 2002 indicated no significant departures from analytical results of previous years.

Elevated levels of nitrate, sulfate, and uranium in ground water in the paleochannels are most likely due to leaching of natural soils and weathered shale around the paleochannels. Increased runoff from the cell may have increased moisture in soils, paleochannels, and weathered shale around the disposal cell, which would increase the mobility of nitrate, sulfate, and uranium in these materials.

6E Monitoring results indicate the disposal cell is not degrading water quality in the paleochannels. This is expected because water levels in the paleochannels are significantly higher than in the cell. Consequently, wells 0731 and 0732 will not be affected by transient drainage from the cell.

5.0 Corrective Action

Corrective action addresses out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2002.